wherein the reflector is formed of a ceramic having a thermal conductivity of at least about 0.005 (cal/cm·sec·deg) at a temperature of 20°C.

The claimed invention is also, as recited in Claim 7, a projector, comprising an illuminating optical system including the above light source device; an electrooptic device that modulates light emitted from the illuminating optical system in response to image information; and a projection optical system that projects a modulated light obtained by the electrooptic device.

The rejection of Claims 1-13 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,621,267 (Shaffner et al), is respectfully traversed. As shown by the Kyocera data sheet and English translation thereof (3 total pages) submitted herewith, alumina can have various thermal conductivities according to its content (%) and appearance. Porous alumina (e.g., No. A-410 or No. A-432) has a thermal conductivity of 0.004 cal/cm/sec/deg at 20°C. Thus, it is not inherent that alumina has a thermal conductivity of at least 0.005 cal/cm/sec/deg at 20°C. As the Examiner notes, Shaffner et al discloses a high-power metal halide reflector lamp wherein the lamp contains a ceramic reflector made of alumina, i.e., Al₂O₃. Shaffner et al discloses a cast reflector (column 3, lines 8-10, Fig. 3 and column 3, lines 56-58). The cast reflector has a rough inside surface (column 3, lines 10-15) and is almost completely comprised of alumina. Thus, it is respectfully submitted that this reflector, like above No. A-410, is formed of porous alumina having a relatively small thermal conductivity, i.e., less than 0.005 cal/cm/sec/deg at 20°C. Nor would it have been obvious, without the present disclosure as a guide, to use an alumina in Shaffner et al meeting the presently-recited thermal conductivity limitation.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,

MAIER, & NEUSTAD, P.C.

Norman F. Oblon Attorney of Record Registration No. 24,618

Harris A. Pitlick

Registration No. 38,779

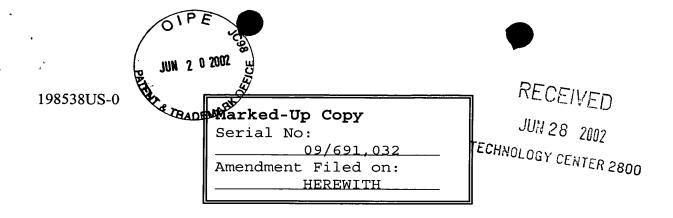
22850

(703) 413-3000

Fax #: (703)413-2220

NFO:HAP:kst

I:\atty\HAP\198538us-am.wpd



IN THE CLAIMS

- --3. (Amended) A light source device in accordance with claim 2, wherein the ceramic is composed of any material selected from the group consisting of Al₂O₃, 2MgO·SiO₂, MgO·SiO₂, ZrO₂·SiO₂, TiO₂ [compounds], SiC, Si₃N₄, ZrO₂, and cermet.
- 9. (Amended) A projector in accordance with claim 8, wherein the ceramic is composed of any material selected from the group consisting of Al₂O₃, 2MgO·SiO₂, MgO·SiO₂, ZrO₂·SiO₂, TiO₂ [compounds], SiC, Si₃N₄, ZrO₂, and cermet.

Claims 14-31 (New) .--

H TOTAL		41 H		· ·	本 第 角 冊	ì	24 25 25	(本)	45 45 45	建	#	# # # # # # # # # # # # # # # # # # #	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	線服装	4 4	4	田	# F	ピッカ	¥ *	Ur S	## ###	#		アルミ	Ro	*	4. W	# / m /
9(30%)800	58)850	306(%09)###	麻	倉正禄 (IMHz)	(ZHWI)	5000	3000	20°C	52t 25	表用温度	22	20°C	40~800°C	40~400°C	ソンド	グ田	強度	遊費	ース硬さ	#	₩		± 3≩		ナ含有!			7	
	dy.		(×10-4)	(×10-4)	1		8 5		KV/PB	ਰ	cal /g°C	cal · cm	(x 10-e)	2	1	(X 10°)	kg/cd	kg/cal	阿里500g	%ª	ı	W #	,)		# (%)	(E)	=	š	# # X
	il.		ı		5.0	1012	>101	>101*	10	1,600	1	0.004	7.5	6.8	ı	ı		650	1	51-5	2.4	100 mm	・脱ガス 容易 ・電気絶縁 性保汚		99.9	白色		A-410	
		12		1	1	1	1	1	ı	1,600	Ţ	1	8.0	6.5	1		1.	500	_	5-20	2.9	AU SA	耐熱性大	\$	١	台色	V 50	A-420	
**************************************			1	1	1	ı	1	1	1	1,000	1	ī	8.1	7.0	ı	1	1	700	_	5-15	2.5		含油柱	孔質	1	無	光質	A-430	
	1300		ı	1	1	1010	1013	>101	8	1,600	1	0.004	7.7	6.8		1	ı	8	١	10~15	2.4		·耐热性 ·電気絶線 性優秀		ı	白色		A-432	7
北京			J	ı	J		j	1	J	1, 750	0. 19	0.07	7.7	6.8	0. 19	3.8	26,000	3, 500	1, 750	0	3.9		· 表面平滑		99.7	(多らな)		A-23 (A-23R)	7.
		/1.2 5 %	ı	1	ı	1	1	ı	1	1	0.19	0.07	7.8	1	1	3.9	40,000	5, 400	2, 100	0	3.9		·高温链点 大	強度	99.7	鱼色		A-56	,,,
新城				1	ı	Ī	1	1	1	ı	0.17	0.08	8.0	1	ı	3.8	45,000	7,500	2,300	0			· 旅馆	·耐摩耗性		黑色		A-61	+
		12.50	1	1	1	1	1	,	1	,	0.19	0.07	7.8	ı	1	3.9	1	3, 200	1,800	0	4.0		·色調光訳 ·透光性 身好	大	1.	各色	5+	A-150	Â
			ı	ı	ı	1	ı	1	1	1,650	0. 19	0.06	7.7	6.8	0. 20	3.6	1	2,900	1,600	0	3.8	È	- 赛面平滑		88	白色(あつき色)	的質	A-201 (A-201R)	(A1203)
# 1 W	13		١	1		107	10°	101.	10	1, 500	0. 20	0.04	7.8	7.0		1	١	2, 800	1,300	0	3.6	ID/ベック サラボ(等	・ 追光性 大 ・ メタライ ス性 良好		90	黒紫色		A-440	
	を記され		ı	1	,	1	1	٥,	1	1,200	1	-1	8.0	7.1	ļ	1	1	1, 800	1,000	0	3.7	· Wassa	·導電性		76	黒褐色		A-442	
新城	新	16	١	ı		107	é	101	6	1,200	0.19	0.04	œ ~	7.2	ı	ı	1	2, 100	1, 100	0	3.9	ウージ マークス リマータ 現場・	· 追光性大 · 熱放放性 良好		19	黒褐色		A-445	
報告	変え	191		 	-	-	-	حنب	l,			_		 	 	 	 	2				会と記述	 -	100 mg		Sat			
華 英	11 m		133	ω	8.5	6	10,1	ō.	ō	,500	0. 20	0.04	7.8	7.0	0.30	2.6	<u> </u>	8	, 300	0	3.6	7	納住大		8	かき		A-459	
	0.	C404	1		J	1	1	1	1	,600	0.19	0.06	7.6	6.7	0.21	3.4	- 2	2,600 3,	,600 1	0	3.8		対解権と		8	(A)		A-460 /	İ
0.91	8	0.32	76	68	9.5	10.0	101	, 0!.	6	1,500 1	0. 19 0.	0.04 0.	7.7	6.9	0. 23 0.	2.7	23, 500	, 200 2,	1, 350	0	3.6	10多層パース 10タケーグ 10 10番で 10 10番目 20 10番目 20 10 10 10 10 10 10 10 10 10 10 10 10 10	・メタライ・製 ス性良好・印 ・強度大 良		92	EP (40)	υt	A-473 A	7
(A) (A)	0.	0.				٠ •	10"	>10"	5	,600	1. 19 0.	8	7.8	7.1	0. 23	3.2	22	8	1,500 1,	0	3.8	の の の の の の の の の の の の の の	· 喪商平滑 · 硬度大 · 印刷性 · 耐食性 良好 使秀	高周波	96	色色	的質	A-476 A	,
26	ස <u>.</u>	, 5 ,	56	2	9.7	6	, <u>.</u>	101	6	1,600 1,	.19 0.	0.06 0	7.9 7.	7.1	. 25 0.	3.5	22,000 24	3, 100 3,	1,650 1,	0	μ 8	・耐機・一・耐・耐な物品・食物・食物の		高周波電気絶線性優秀	99	色色		A-479 A-	11
0.	.0	 	1	 	10.2	<u> </u>		, 0 ·	 	1,600 1,	.19 0.	0.06 0	9	7.1 6.	. 23 0.	3.7 3.	24, 000	300	1,800 1,	0	3.8	・ 西原花・ ・ 耐・ 耐食館品・耐・ 電算機 スライダー	· 硬度大 · 便 · 耐食性大 · 耐 · 耐厚样性 · 熱 · 大 大	•	99.5	(B)		A-479SS A-	,,,
20	8	0.08	_	' 	<u>'</u> -	<u> </u> -		101	,	750 1,	19 0.	0.07 0.	7.8 7	. 8 (6.	19	8		200 (2.	1,800 1,	0	3.9 3.	対象の	·硬度大 ·耐 ·耐食性大 ·熱間強度 大	強度大・耐	99. 8	象牙色(ビン	(g)	A-480 (A-	+
(数 10	erij.	0.					1	<u>'</u>		1,500 1,	0.	0.02 0.	7.1 7	Э.	0	3		1.600 (2.000) 3,	1,000 1,	0.6	6	・諸侯用 ・ 掲集的 ・ スル・・キャブ ・ グラスフ タン ・ ナイバー 用ノスル	· 耐热性大 · 耐服 大	耐熱性優秀	76	白色 白色	多孔質	A-482 (A-482R) A-	
95	0.34	0.14	_		'		-1	-101.	_	1,500 1,	0.	0.04	7.7 7.	6.	25 -	3.0 3.		100 3,	1,400 1,	-	3.6 . 3	18	·耐摩耗性·耐炸大		93	7. 84		A-484 A-	(A1203)
[-ici			-	1	9.		_ 10	<u>'</u>	_	1,600 -	19 0.	0.	7.7 7	.8 6.		5		300 2,	1,600	-	3.8 3	バーナー・ハイフル ンズル 10領題は 委板	・耐熱性大・委乱		96 99.	色白	が設置	A-486 A-	
	参	沙灣	19	2 -	9.7	10''	1014 -	>10" -	5	=	0.	0.06 0.	7.7	-		۱	25,	2,800 4,1	1,600 1,0	0	3.8 3.		・英面平滑・表面		5	EP E		A-490 A-	
	G	*			(100		-	-		500	<u>19</u>	9	7.9	7.0 30		4.0	25, 000	4,000	1,600	0	7	76 × 3 × 5	· 政而平滑 · 前 · 前 · 光	- A () a	98	(B)	12.4	A-500	1
光透過率 3		10 经数据 X	3533		(10°-10°0 Hz5:C)			·. 01 11 8 14 19 19		(表 2,000 (配点2,050°C)	15年第10.18月	据第13% 0.17条制	の軸に垂直	C軸に平行	美國教育	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	極	7, 000	2.	0	与国际第97日第一	(500 基础) 建筑 (500 基础)	耐效性大 高国波電気能線性使素 光透加性大(透明)	提供的強度大	重品。99.	*	5	7S	単結晶サファイア(A) ₂ 0 ₃)
過年 3,000Å ~ 3,500Å	361176	18 7a			O裁に平行11.5 C裁に無直 9.3			0:0		#2,050°C	18		200	Z.	建	18.6	30,000	000	300	0	97 15		HERRICAL STATES		9.9	#	A A	SA-100	7/7/A
500A	8	*8		35°	行11.5 員 9.3				**		: Gun		4 .5	5.3		·		. A.S.			1988 1				Algeric Tele		No.		1203)

	Characteristic	Chemical						Characteristic	Electrical				Characteristic	Thermal				Characteristic	Mechanical	Water Absorption	Bulk Specific Gravity	Main Applications	Main Characteristics	Alumina Content (A)	Color	Appearance	KYOCERA No.	
Caustic Soda (30%) 80°C	Sulfuric Acid (95%) 95°C	Nitric Acid (60%) 90°C	Loss factor	Dielectric Loss Angle (1MHz)	Dielectric Constant (1MHz)		Volume Resistivity		Dielectric Strength	Maximum Working Temperature	Specific Heat	Thermal Conductivity		Coefficient of Linear	Poisson's Ratio	Young's Modulus	Compressive Strength	Flexural Strength	Vickers Hardness	tion	Gravity	ions	eristics	SIL (A)				ltem/Material
				MHz)	赱	500℃	300°C	20°C		rature		20°C	40-800°C	40-400°C								1						aterial
	mg/cm2/day		(×10 ⁻ -4)	(×10 ⁻ -4)	ı		Ω·a		KV/mm	ರೆ	cal/(g·°C)	cal·cm/(cm2·sec·°C)	(×10 ⁻ -6)	1/°C	-	Kg/cm2 (×10~6)	Kg/cm2	Kg/cm2	Kg/mm2 (load 500g)	×	1							
1	-	ı	ı	1	5.0	10,12	>10'14)10 ⁻ 14	10	1,600		0.004	7.5	6.8	1	-	1	650	1	5-15	2.4	electronic tube cathode, tube, heater insulating tube	degassing facility, high insulation	8.66	White		A-410	
1	ı	ı	,	1	-	-	1	,	-	1,600	-	-	8.0	6.5	1	-	-	500	1	5-20	2.9	setter and component for fireproof	high heat resistance	, Por	White	Por	A-420	
1		-	'	-	,	-		,	_	1,000	-	-	8.1	7.0	-	-	-	700	1	5-15	2.5	oiling roller	oil impregnation	Porous	Black	orous	A-430	
1	,	-		,		10,10	10.13	>10.14	10	1,600	1	0.004	7.7	6.8	1	1	-	600	1	10-15	2.4	electronic tube heat resisting component	heat resistance,h gh insulation		White		A-432	
-	'	-	1	-	1				_	1,750	0.19	0.07	7.7	6.8	0.19	3.8	26,000	3,500	1,750	0	3.9	thread guido cutting tool	heat mechanical mechanical resistance.hi good surface strength at gh insulation smoothness high temperature	high mechani	(Russet) White	# I	A-23 (A-23R)	
,	1	r	,	,	·		,	,	-	ı	0.19	0.07	7.8	ı	ľ	3.9	40,000	5,400	2,100	0	3.9			cal strength.	White		A~56	
-	-	1	1	-	ŧ		1	'	_	ı	0.17	0.08	8.0	ı	1	3.8	45,000	7,500	2,300	0	4.1	cutting tool, wear resistant component	hard. good thermal conductivity	high wear resistance	Black		A-61	
-	,	ŧ	1	,	ı		'		_	ı	0.19	0.07	7.8	ı	1	3.9	1	3,200	1,800	0	4.0	ornament	glossy. translucency	tance	several		A-150	
-	_	-	,	_	1	,	-	ı	-	1,650	0.19	0.06	7.7	6.8	0.20	3.6	-	2,900	1,600	0	3.8	thread guide	good surface smoothness	90	(Russet)	WF:+	A-201 (A-201R)	
-			-	_	ı	107	10'9	10,14	10	1.500	0.20	0.04	7.8	7.0	-	1	1	2,800	1,300	0	3.6	IC package, display tube	light good surface intercepting, smoothness good metallization	high frequen	Dark violet		A-440	
,	_	ı	,	_	1	,	ı	8,01	-	1,200	1	_	8.0	7.1	•	1	-	1,800	1,000	0	3.7	slidable component	conductive	y insulation.h	Dark brown		A-442	
-	٠	ı			ı	10'7	10.8	10,15	10	1.200	0.19	0.04	8.1	7.2	,	-	ı	2,100	1.100	0	3.9	IC package, transistor header, display tube	light intercepting, high heat high heat resistance	igh mechanica	Dark brown	Dense	A-445	ALMINJ
'	'		25	ω.	œ :51	10.9	10 12	10 14	10	1.500	0.20	0.04	7.8	7.0	0.30	2.6	1	2,900	1,300	0	3.6	burner nozzle	high heat resistance	high frequency insulation high mechanical strength, high heat resistance	Russet		A-459	ALMINA (AI203)
'	-	_	,	1	1	-	1	1	1	1,600	0.19	0.06	7.6	6.7	0.21	3.4	1	2,600	1.600	0	3.8	thread guide	high wear resistance	h heat resista	Russet		A-460	
0.91	0.65	0.32	76	8	9.5	10,10	10,13	>10^14	10	1.500	0.19	0.04	7.7	6.9	0.23	2.7	23.500	3.200	1,350	0	3.6		good metallization, high mechanical strength	Ince	White		A-473	

no less than 80% at 3,000 Å-3,500 Å	light transmittance		1	1	ī	0.95	-	0.20	-	0.26	-
Ne 1.760	a moor	Characteristic	1	1	-	0.34	-	0.32		0.33	1
No 1.768	refractive index	Optical	ı	1	-	0.14	_	0.08		0.10	1
			ı	19	1	١	1	-	-	19	ı
	1		1	2	1	-	-	_	-	2	-
9.3	vertical to c axis	25°C)	,	ÿ.	,	-		ı	10.2	9.7	ı
11.5	parallel to c axis	(10 [°] 3-10 [°] 10Hz		.7						2	
	1		-	10,11	-	1	-	,	-	10~9	10.9
	1		-	10^14	1	-	-	-	ı	10,11	10,11
6	10 16		')10°14	1	>10'14		>10~14	>10 [°] 14	>10-14	>10'14
	1		-	5			1	1	1	10	10
int 2.050°C)	2,000(melting point 2,050°C)		1.500	'	1,600	1.500	1,500	1,750	1,600	1,600	1,600
	0.18		0.19	0.19	0.19	0.19	0.18	0.19	0.19	0.19	0.19
	0.1		0.07	0.06	0.05	0.04	0.02	0.07	0.06	0.06	0.05
4.5		vertical to c axis	7.9	7.7	7.7	7.7	7.1	7.8	7.9	7.9	7.8
5.3	25°C	parallel to c axis	7.0	6.8	6.8	6.8	6.4 (6.0)	6.8	7.1	7.1	7.1
			,		,	0.25	-	0.19	0.23	0.25	0.23
	4.8		4.0	1	3.5	3.0	-	3.8	3.7	3.5	3.2
Õ	30,000		25,000	1	,			,	24.000	22,000	-
	7,000		4,000	2,800	3,300	3,100	1,600 (2,000)	3,200	3,300	3.100	2,800
	2.300		1,600	1.600	1.600	1,400	1.000	1,800	1,800	1,650	1.500
	0		0	0	0	0	0.6	0	0		0
	3.97		3.7	3.8	3.8	3.6	3.6	3.9	ა 8	3.8	3.8
SOS substrate, window for high-temperature and high-pressure device, structure component, physicochemistry device component	for high-temperature and mistry device component	SOS substrate, window component, physicochi	thread guide	substrate for hybrid IC thin film	burner nozzle	slidable component, capstan	welding nozzle, nozzle for glass fiber	2 ·	•	heat, wear substrate for and hybrid IC corrosion thick film resistant component	substrate fo hybrid IC thick film
high mechanical strength, high heat resistance, chemically stable, high frequency insulation, high translucency (transparent)	th, high heat resistance, cency (transparent)	high mechanical streng insulation, high translu	good surface smoothness	good surface good surface smoothness smoothness	high heat resistance	high wear resistance	high heat resistance	hard, chemically stable, hot mechanical strength	hard. chemically stable, high wear resistance	hard, chemically stable	good surface smoothness, good printing
	99.9		98	99.5	96	93	76	99.8	99.5	99	96
ent	Transparent		White	White	Russet	White	White (Pink)	lvory	White	White	White
	Dense			Dense	De		Porous				
0	SA-100		A-500	A-490	A-486	A-484	A-482 (A-482P)	A-480	A-479SS	A-479	A-476
SAPPHIRE	Single Crystal SAPPHIRE										